

REMARKS

Applicants request favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Claims 20-22, 26-32, 37 and 40-47 are presented for consideration. Claims 20, 26-31, 37, 40-42 and 46 are independent. Claims 19, 23, 25, 33-36, 38 and 39 have been canceled without prejudice or disclaimer. Claims 20, 26-31, 37, 40 and 41 have been amended to clarify features of the invention, while claims 42-47 have been added to recite additional features of the invention. Support for these changes and claims can be found in the original application, as filed. Therefore, no new matter has been added.

Applicants note with appreciation that claims 20-23, 26-32, 37, 40 and 41 have been indicated as containing allowable subject matter and would be allowed if rewritten in independent form. To expedite prosecution, claims 20, 26-31, 37, 40 and 41 have been so rewritten. Therefore, Applicants submit that these claims, as well as claims 21, 22, and 32, variously depending from independent claims 20 and 31, should be deemed allowable at the outset. In addition to these claims being allowable, Applicants submit that claim 42-47 patentably define features of the subject invention. Accordingly, Applicants request favorable reconsideration and withdrawal of the objections and rejections set forth in the above-noted Office Action.

Claim 38 was rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 8 of U.S. Patent No. 6,252,648. Claims 19 and 25 were rejected under the judicially created doctrine of obviousness-type double patenting over

claims 8 and 9, respectively, of U.S. Patent No. 6,252,648. Claims 19, 33, 34, 36 and 39 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,454,347 to Shibata et al. Claim 35 was rejected under 35 U.S.C. § 103 as being unpatentable over the Shibata et al. patent in view of U.S. Patent No. 5,681,759 to Zhang. Applicants submit that the cited art does not teach many features of the present invention, as previously recited in claims 19, 25, 33-36, 38 and 39. Therefore, these rejections are respectfully traversed. Nevertheless, to expedite allowance of the subject application, Applicants have canceled these claims without prejudice or disclaimer. Accordingly, the foregoing rejections have become moot and should be withdrawn.

For the reasons noted above, Applicants submit that claims 20-22, 26-32, 37, 40 and 41 should be deemed allowable and the statutory and obviousness-type double patenting rejections should be deemed to have been overcome, with respect to claims 19, 25, 33-36, 38 and 39.

In addition to the foregoing claims being allowable, Applicants submit that new claims 42-47 patentably define features of the present invention. Specifically, independent claims 42 and 46 recite various aspects of the exposure apparatus of the present invention, while claims 45 and 47 recite various aspects of the device manufacturing method of the present invention. Applicants submit that at least the arrangement of the optical system, first supplier and second supplier, as recited in these claims, is not disclosed or shown by the cited art. Applicants submit, therefore, that claims 42-47 likewise should be deemed allowable.


For the foregoing reasons, Applicant submit that the present invention is patentably defined by independent claims 20, 26-31, 37, 40-42 and 46.

Dependent claims 21, 22, 32, 43-45 and 47 also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their respective independent claims. Further individual consideration of these dependent claims is requested.

Applicants further submit that the instant application is in condition for allowance. Favorable reconsideration, withdrawal of the objections and rejections set forth in the above-noted Office Action and an early Notice of Allowance are also requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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APPENDIX A

IN THE CLAIMS

20. (Amended) An exposure apparatus [according to Claim 38,] comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies one of oxygen and clean air into the closed space;

a discharger, which discharges the gas from the closed space; and

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element,

wherein said controller controls said first supplier and said second supplier.

26. (Amended) An exposure apparatus [according to Claim 38,] comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies one of oxygen and clean air into the closed space;

a discharger, which discharges the gas from the closed space; and

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element,

wherein said controller changes the wavelength of the exposure beam into a wavelength region higher than an oxygen absorptivity when said second supplier supplies the oxygen.

27. (Amended) An exposure apparatus [according to Claim 38,] comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies one of oxygen and clean air into the closed space;

a discharger, which discharges the gas from the closed space; and
a controller for changing a wavelength of the exposure beam between an exposure
process for the substrate and a cleaning process for the optical element,

wherein said controller changes the wavelength of the exposure beam to a shorter wavelength when said second supplier supplies the oxygen.

28. (Amended) An exposure apparatus [according to Claim 38,] comprising:
an optical system, which directs an exposure beam emitted from a light source
onto a substrate, said optical system including a casing and an optical element, said casing having
a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;
a second supplier, which supplies one of oxygen and clean air into the closed
space;

a discharger, which discharges the gas from the closed space;
a controller for changing a wavelength of the exposure beam between an exposure
process for the substrate and a cleaning process for the optical element; and

[further comprising] a laser control device which changes the emission laser wavelength region,

wherein said controller controls said laser control device.

29. (Amended) An exposure apparatus [according to Claim 38,] comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies one of oxygen and clean air into the closed space;

a discharger, which discharges the gas from the closed space; and

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element,

wherein said controller oscillates the wavelength region continuously.

30. (Amended) An exposure apparatus [according to Claim 38,] comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies one of oxygen and clean air into the closed space;

a discharger, which discharges the gas from the closed space; and

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element,

wherein said controller controls actuation of said light source.

31. (Amended) An exposure apparatus [according to Claim 38,] comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies one of oxygen and clean air into the closed space;

a discharger, which discharges the gas from the closed space; and

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element,

wherein said controller inserts a wavelength changing element into a path of the exposure beam.

37. (Amended) A device manufacturing method comprising the steps of:

providing an exposure apparatus comprising:

(i) an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element,

said casing having a closed space and said optical element being disposed in the closed space,

(ii) a first supplier, which supplies an inert gas into the closed space,

(iii) a second supplier, which supplies one of oxygen and clean air into the closed space,

(iv) a discharger, which discharges the gas from the closed space, and

(v) a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element;

exposing a substrate by use of the exposure apparatus; and

developing the exposed substrate.

40. (Amended) An exposure apparatus [according to Claim 39,] comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies one of oxygen and clean air into the closed space; and

a controller, which controls concentration of oxygen in the closed space,

wherein said controller functions so that, before exposure of the substrate, the inside of the closed space is filled with substantially only the inert gas.

41. (Amended) A device manufacturing method, comprising the steps of:

providing an exposure apparatus [as recited in Claim 39;] comprising:

(i) an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

(ii) a first supplier, which supplies an inert gas into the closed space,

(iii) a second supplier, which supplies one of oxygen and clean air into the closed space, and

(iv) a controller, which controls concentration of oxygen in the closed space;

exposing a substrate by use of the exposure apparatus; and

developing the exposed substrate.